SENSORLESS SWITCHED RELUCTANCE ELECTRIC MACHINE WITH SEGMENTED STATOR

ABSTRACT OF THE DISCLOSURE

A sensorless switched reluctance machine includes a stator with a plurality of circumferentially-spaced stator segment assemblies that include salient stator poles and inter-polar stator slots. Each of the stator segment assemblies includes a stack of stator plates forming a stator segment core, an end cap assembly, and winding wire wound around the stator segment core and the end cap assembly. The rotor defines a plurality of rotor poles. The rotor tends to rotate relative to the stator to a rotational position that maximizes the inductance of an energized winding. A sensorless drive circuit derives rotor position and energizes the winding wire around the stator segment assemblies based on the derived rotor position. Each stator plate includes a first radially outer rim section and a tooth section that extends radially inwardly from a first center portion of the first radially outer rim section.